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EXAMINER	
ABOAGYE, MICHAEL	
ART UNIT	PAPER NUMBER
1793	

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09/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,177	ILYUSHENKO ET AL.	
	Examiner	Art Unit	
	MICHAEL ABOAGYE	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/03/2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *9,10,12,13,15,16 and 22-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *9,10,12,13,15,16 and 22-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 9, 10, 12, 13, 15, 16 and 22-31 remain under consideration in the application.

Status of Previous Rejections

2. Previous rejections of claims 9, 10, 12,13,15,16 and 22-31 under 35 U.S.C. 103 by the combination of Forrest et al. (US Patent No. 6,398,883) and Thomas et al. (WO 93/10935) have been withdrawn in view of applicants arguments and subsequent interview between Applicant's representative and Examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 9, 10, 12, 13, 15, 16 and 22-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) (Applicant's Specification , Page 1, lines 1-21) in view of Litwinski et al. (US Patent No. 6,726,085) and Ezumi et al. (US Patent No. 6,659,330).

Regarding claims 9 and 10, AAPA teaches a method of welding together two workpieces, the method comprising: aligning the respective workpieces so that an abutment region is formed therebetween, and fusion welding the two workpieces together, characterized in that the workpieces that melt during the fusion welding process is at least partially encompassed within said abutted region formed therebetween (Applicant's Specification, Page 1, lines 1-21).

AAPA, however fails to teach friction stir welding a region of each work-piece to extends only part way into the work-piece, and also preparing the friction stir welded regions of at least each of the workpieces prior to fusion welding said workpieces together such that a fusion welded region of the workpieces that melts during the fusion welding process is at least partially encompassed within the friction welded regions of the workpieces.

Litwinski et al. teaches a method of forming a metal preform (26, figure 16) from a metallic workpiece (22 figure 2, and column 6, lines 3-16); comprising friction stir welding the workpiece such that the entire workpiece is mixed or stirred (column 15, lines 15-24) to produce a metal preform having refined grain structure, thereby improving the material properties of the workpiece such as formability, weldability, toughness, corrosion resistance and strength (see, abstract , column 2, lines 6-15 and column 4, lines 20-24); wherein said preform (26) can be further machined into a structural member that can be connected to other structural members using fasteners or welding techniques to form a structural assembly, such as frames of an aerospace vehicle (column 15, lines 44-58).

Litwinski et al. also teaches stirring the entire surfaces of workpiece to produce a preform with overall surface refined grain structure; therefore any surface abutted to other structural members for welding would be that of the prepared or stirred surface. Litwinski et al. also teaches forming structural members and assemblies using said surface refined performs (see, column 3, lines 65-67). Litwinski et al. further teaches forming said preforms from materials including aluminum/alloy and titanium/alloys.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the process of AAPA to use two preforms that have already been prepared by friction stir welding along their respective surfaces to be abutted for fusion welding on the basis of Litwinski et al.'s teachings (See Litwinski et al., column 3, lines 65-67 and abstract), since said prepared preforms have improved weldability, toughness, corrosion resistance and strength, which are properties critical for aerospace applications (see Litwinski et al., abstract , column 2, lines 6-15, column 4, lines 20-24 and column 6, lines 38-41).

Litwinski et al. does not specifically teach a subsequent surface preparation step after the friction stir welding.

Ezumi et al. teaches a subsequent surface preparation step after the friction stir welding process comprising performing hairlines finishing for smoothing out the friction stir welded surface (see, Ezumi et al., column 5, lines 20-24).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the combined process of AAPA and Litwinski to prepare the friction stir welded regions of each workpiece performing hairlines finishing to

remove any serrations as taught by Ezumi et al. and thereby achieving smoothed surfaces that can be perfectly abutted or aligned in a poised position for fusion welding (see, Ezumi et al., column 5, lines 20-24).

Regarding claims 12 and 13, AAPA teaches work-pieces, when joined, form at least part of a block of metal, the method further including the step of manufacturing an aircraft component, wherein the aircraft component is machined from the block of metal (See, Applicant's Specification , Page 1, lines 1-21).

Regarding claims 15 and 16, AAPA teaches a method further including a step of making an aircraft component from the work-pieces when welded together, and a step of manufacturing an aircraft including the aircraft component (See, Applicant's Specification , Page 1, lines 1-21).

Regarding claim 22, AAPA teaches a method of manufacturing an aircraft component, comprising the steps of providing two or more metal work-pieces, each work-piece having a least cross-sectional dimension of 50mm or greater (See, Applicant's Specification, Page 1, lines 5-10); arranging said two or more work-pieces so that the surface of each of said two work-pieces abuts the substantially flat surface of another of said two or more work-pieces; fusion welding the abutting substantially flat surfaces, thereby joining the workpieces together to form a block of metal, the fusion welding causing material in the welded region of each work-piece to melt to a distance extending into the work-piece, machining metal away from the block of metal to form an aircraft component (Applicant's Specification , Page 1, lines 1-21). (Note, AAPA specifically teaches said aircraft component being manufactured from the thick welded

block, therefore said manufacturing process encompasses said claimed machining step)

AAPA, however fails to teach friction stir welding a region of each work-piece to extends only part way or first distance into the work-piece, and also skimming the friction stir welded regions of at least each of the workpieces prior to fusion welding said workpieces together such that a fusion welded region of the workpieces that melts during the fusion welding process is at least partially encompassed within the friction welded regions of the workpieces.

Litwinski et al. teaches a method of forming a metal preform (26, figure 16) from a metallic workpiece (22 figure 2, and column 6, lines 3-16); comprising friction stir welding the workpiece such that the entire workpiece is mixed or stirred (column 15, lines 15-24) to produce metal preform having refined grain structure, thereby improving the material properties of the workpiece such as formability, weldability, toughness, corrosion resistance and strength (see, abstract , column 2, lines 6-15 and column 4, lines 20-24); wherein said preform (26) can be further machined into a structural member that can be connected to other structural members using fasteners or welding techniques to form a structural assembly, such as frames of an aerospace vehicle (column 15, lines 44-58).

Litwinski et al. also teaches stirring the entire surfaces of workpiece to produce a preform with overall surface refined grain structure, therefore any surface abutted to other structural members for welding would be that of a prepared or stirred surface. Litwinski et al. also teaches forming structural members and assemblies using said

surface refined performs (see, column 3, lines 65-67). Litwinski et al. further teaches forming said performs from materials including aluminum/alloy and titanium/alloys.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the process of AAPA to use two preforms that have already been friction stir welded along their respective surfaces to be abutted for fusion welding on the basis of Litwinski et al.'s teachings (see (see, column 3, lines 65-67 and abstract), since said prepared preforms have improved weldability, toughness, corrosion resistance and strength, which are properties critical for aerospace applications (see Litwinski et al., abstract , column 2, lines 6-15, column 4, lines 20-24 and column 6, lines 38-41).

Litwinski et al. does not specifically teach a subsequent skimming step after the friction stir welding.

Ezumi et al. teaches a subsequent surface preparation step after the friction stir welding process comprising performing hairlines finishing which is equated to skimming to smooth out the friction stir welded surface (see, Ezumi et al., column 5, lines 20-24).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the combined process of AAPA. and Litwinski et al. to prepare the friction stir welded regions of each workpiece by performing hairlines finishing to remove any serrations as taught by Ezumi et al. and thereby achieving smoothed surfaces that can be perfectly abutted or aligned in a poised position for fusion welding (see, Ezumi et al., column 5, lines 20-24).

5. Claims 23-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) (Applicant's Specification , Page 1, lines 1-21) in view of Litwinski et al. (US Patent No. 6,726,085).

Regarding claim 23, AAPA teaches a method of joining two metal work-pieces, the method comprising: providing two metal work-pieces, each work-piece presenting at least one face defining a plane (Note, AAPA teaches two workpieces in abutted relationship, and such reads on these limitations); arranging the work-pieces so that the face of one work-piece abuts the face of the other work-piece at a butt joint; and then welding the two work-pieces together at the butt joint with a fusion welding process thereby defining a melted region extending into each work-piece a distance from the plane of the face.

AAPA, however fails to teach preparing the work-pieces by applying a friction stir welding process on the face of each work-piece, the friction stir welding process defining a treated region extending a first distance into the work-piece from the plane of the face, the treated region having a grain structure that is finer than the grain structure of the work-piece outside the treated region.

Litwinski et al. teaches a method of forming a metal preform (26, figure 16) from a metallic workpiece (22 figure 2, and column 6, lines 3-16); comprising friction stir welding the workpiece such that the entire workpiece is mixed or stirred (column 15, lines 15-24) to produce metal preform having refined grain structure, thereby improving the material properties of the workpiece such as formability, weldability, toughness, corrosion resistance and strength (see, abstract , column 2, lines 6-15 and column 4,

lines 20-24); wherein said preform (26) can be further machined into a structural member that can be connected to other structural members using fasteners or welding techniques to form a structural assembly, such as frames of an aerospace vehicle (column 15, lines 44-58).

Litwinski et al. also teaches stirring the entire surfaces of workpiece to produce a preform with overall surface refined grain structure, therefore any surface abutted to other structural members for welding would be that of a prepared or stirred surface. Litwinski et al. also teaches forming structural members and assemblies using said surface refined performs (see, column 3, lines 65-67). Litwinski et al. further teaches forming said performs from materials including aluminum/alloy and titanium/alloys.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the process of AAPA to use two preforms that have already been friction stir welded along their respective surfaces to be abutted for fusion welding on the basis of Litwinski et al.'s teachings (see (see, column 3, lines 65-67 and abstract), since said prepared preforms have improved weldability, toughness, corrosion resistance and strength, which are properties critical for aerospace applications (see Litwinski et al., abstract , column 2, lines 6-15, column 4, lines 20-24 and column 6, lines 38-41).

Regarding claim 24, AAPA as modified by Litwinski et al. teach applying a friction stir welding process to prepare a face of each work-piece, however the specific claimed distance of 10 mm to which said face preparation extends into each of said workpieces is not taught. However selection of a suitable prepared distance not to

exceed the entire thickness of 50 mm would have been within purview of one of ordinary skill in the art.

Regarding claim 25, AAPA teaches at least dimension of the face of each work-piece as 50mm or greater (See, Applicant's Specification, Page 1, lines 5-10).

Regarding claim 26 Litwinski et al. teaches machining the face of each work-piece after the friction stir welding process (Litwinski et al., column 15, lines 50-55). Therefore AAPA as modified by Litwinski et al. meet the claimed limitation.

Regarding claim 27, AAPA teaches fusion welding process that is performed by means of an electron beam welding process (See, Applicant's Specification, Page 1, lines 1-21).

Regarding claim 28, AAPA teaches work-pieces that are made from aluminum alloys (See, Applicant's Specification, Page 1, lines 1-21).

Regarding claim 29, AAPA teaches work-pieces that are made from aluminum alloys, but is silent as to whether the workpieces are of different materials. However, AAPA recognizes all the variation of Aluminum alloys used or suitable for manufacturing aircraft components, therefore choosing any one of the two workpieces, from any one of the different variants of aluminum alloy is contemplated in the general teaching of AAPA. On this basis selection of two workpieces, one made from a first metal alloy, and other made from a second metal alloy different from the first metal alloy would have been within purview of one of ordinary skill in the art.

Regarding claim 30, AAPA teaches two work-pieces, when welded together, form at least part of a block of metal, the method further comprising machining an aircraft component from the block of metal (See, Applicant's Specification , Page 1, lines 1-21).

Regarding claim 31, AAPA teaches a method further comprising manufacturing an aircraft including the aircraft component (See, Applicant's Specification, Page 1, lines 1-21).

Response to Arguments

AFFIDAVIT UNDER 37 C.F.R.132

6. The Affidavit under 37 CFR 1.132 filed on 05/11/2009 has been considered but is insufficient; there is not enough evidence in the form of data or disclosure to support Applicant's characterization of Forrest et al. reference. Besides the merits of the Affidavit are moot since Forrest et al. reference has been withdrawn from the instant office action.

Finally Applicant's arguments with respect to claim 9, 10, 12, 13, 15, 16 and 22-31 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL ABOAGYE whose telephone number is (571)272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. A./
Examiner, Art Unit 1793

/Jessica L. Ward/
Supervisory Patent Examiner, Art Unit 1793